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IS 12826 (Part 2) : 1990
(Reaffirmed 1996)

Indian Standard

ORDERING, TESTING AND ACCEPTANCE OF INDUSTRIAL FURNACES — CODE OF PRACTICE

PART 2 SUPPLIER'S DATA SHEET FOR THE SUPPLY OF INDUSTRIAL FURNACES

UDC 658·711·4 (083·22) : 66·041

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

September 1990 **Price Group 2**

Industrial Fuel-Fired Furnaces Sectional Committee, MTD 26

FOREWORD

This Indian Standard (Part 2) was adopted by the Bureau of Indian Standards on 22 January 1990, after the draft finalized by the Industrial Fuel-Fired Furnaces Sectional Committee had been approved by the Metallurgical Engineering Division Council.

Industrial furnaces for various applications including heat treatment are required to be designed and supplied for individual applications. After the purchaser has projected his requirements in the tender documents according to Part 1 of this standard, the supplier has to submit his tender. This part (Part 2) of the code will help the supplier in furnishing the details in a systematic manner for effective selection by the purchaser.

The general supply conditions will differ depending on whether the supplier is asked only to supply the material for the furnace or to supply the material together with the project design with or without the operational assembly and installation of the furnace. This standard will enable the supplier to respond appropriately to the specific needs of the purchaser.

This code is being prepared in following three parts to facilitate ordering, supply and acceptance testing of the industrial furnaces:

Part 1 Purchaser's data sheet for ordering of industrial furnaces.
Part 2 Supplier's data sheet for the supply of industrial furnaces.
Part 3 Testing and acceptance of industrial furnaces.

Indian Standard

ORDERING, TESTING AND ACCEPTANCE OF INDUSTRIAL FURNACES — CODE OF PRACTICE

PART 2 SUPPLIER'S DATA SHEET FOR THE SUPPLY OF INDUSTRIAL FURNACES

1 SCOPE

1.1 This standard (Part 2) covers the various parameters that shall form part of the supplier's tender documents for the supply of industrial furnaces ordered by the purchaser in accordance with Part 1 of this standard.

2 REFERENCES

2.1 The Indian Standard IS 8849 : 1978 'Glossary of terms relating to fuel-fired industrial furnaces' is a necessary adjunct to this standard.

3 TERMINOLOGY

3.1 For the purpose of this standard, the definitions given in IS 8849 : 1978 shall apply.

4 INFORMATION TO BE GIVEN BY THE SUPPLIER

4.1 The supplier when responding to the purchaser's tender enquiry shall include all or part (those relevant to the purchaser's requirements) of the following parameters:

a) Type of furnace, its description and dimensions. Enclose sketch/drawing wherever possible;

b) Any indications and limitations regarding the mechanical, chemical and physical characteristics of the products to be treated;

c) Characteristic data of yield and consumption (production, consumption of fuel and energy, etc);

d) Functioning data (continuous, intermittent; period of working cycles and accessories, any specific recommendation on stopping for maintenance work, etc);

e) Characteristics of combustion chamber or of the hearth of the furnace and accessories, fixed supports and moving parts;

f) Heat sources;

g) Method of providing heat and specifications and limitations, if any, of the characteristics of the fuels;

h) Combustion devices (number, type, capacity, location);

j) Instrument/accessories and electrical installations included in the supply;

k) Feed, movement and discharge of the material;

m) Thermal cycle (time/temperature curves, etc);

n) Initial heating of gas and air and heat recovery. Recommended system of heat exchange/recovery system;

p) Temperature and pressure condition to be maintained;

q) Air or atmospheric renewal/recirculation;

r) Controlled atmosphere and method of controlling;

s) Evacuation and purification of the fumes;

t) Heat insulation and refractories;

u) Control and regulating systems;

v) Safety and protection devices;

w) Utilities, requirements, such as, water, power, prepared atmosphere, compressed air, etc, and anything else specified in the purchaser's data sheet, while issuing tender;

x) Accessory installations and equipment;

y) Specific requirements regarding any points concerning the installation (approach, discharges, vibrations, power, etc);

z) Limits/scope of the supply, exclusions and work that have to be carried out by the purchaser to put the installation into operation;

aa) Place and method of delivery and transport of materials, insurance and risks, custody, storage and transport inside the site, any requirements of the working means;

bb) Terms and schedule of delivery, partial and total, and the schedule of work preparation which is the responsibility of the purchaser; and

cc) Terms and schedule of erection/installation and commissioning.

5 MATERIALS OF CONSTRUCTION

5.1 The tender from the supplier shall contain a specific indication of the materials constituting the parts described in **4.1** and their properties, particularly for the supply of refractories (*see* Annex A). The refractories shall conform to the relevant Indian Standards (*see* Annex B).

6 LIMITS OF SUPPLY AND REJECTIONS

6.1 The supplier shall specify accurately the terminal points of the plant and equipment supplied and the limits of the supply and the services to be rendered (materials, installation and consultancy) or of the various parts constituting the individual supply and services.

6.2 The supplier shall also indicate the parts that are excluded from his scope but which are necessary for the functioning of the system offered and parts of the responsibilities and supply of the purchaser.

ANNEX A

(*Clause* 5.1)

SUPPLY OF REFRACTORIES AND OTHER MATERIALS

A-1 SUPPLY OF REFRACTORIES

A-1.0 The supply of refractories is usually in the following forms.

A-1.1 Supply on the Basis of Specifications

The supplier offers the guarantee that the materials supplied by him meet the specifications (*see* Annex B).

A-1.2 Supply with Guarantee of Quality/Suitability

A-1.2.1 The supplier, if required, shall guarantee the quality of the refractory and insulating materials being recommended by him and their suitability limited to conditions specified and any foreseeable deviations specified in the contract.

A-1.3 If required, the supplier shall give the design for the lining of the furnace for which the purchaser provides the functional data limited to the specified operating conditions. In this case also, the supplier shall give the guarantee for the selection of materials in conformity with the project work provided they are used in accordance with his specifications/instructions.

A-1.4 Supply Including Design for Projects and Execution of the Lining

A-1.4.1 If required, the supplier shall design the refractory work, supply material and take charge of providing the lining of the furnaces about which the purchaser shall provide the functional data limited to the specified operating conditions.

In this case the guarantee on the selection, workmanship and the completion of the project work and execution is given by the supplier.

A-1.4.2 If called for, the supplier of the project/design for the lining shall specify the loads and the thrusts transmitted by the lining itself to the structure supporting its own weight, loads of the solids and molten materials, thermal expansions, etc. He shall also indicate the necessary devices for adjustment and taking up such thrusts, loads, expansions and wherever necessary, shall also specify the maximum temperature to which the supporting structures would be exposed.

A-2 EXISTING FURNACE STRUCTURALS

A-2.1 In the case of lining of a furnace whose structure already exists, the supplier of the lining shall design it to be compatible with the structures existing or give information about the necessary alternations.

A-2.2 If the supply covers the project and execution of lining, it may be specified in the order that the supply is agreed to in bulk and unless otherwise specified, the supplier shall supply for the agreed bulk price all that is required for completing the plant according to the project work carried out by him. Any item excluded shall be specifically mentioned. In such a case, the scope and liabilities are to be well understood by the contracting parties and defined in the contract.

A-3 EXCESS OF GENERAL PURPOSE AND SPECIAL MATERIALS

A-3.1 Limited to the refractories, the excess of general purpose and special materials remaining unused from the construction of furnace remain the property of the supplier. The purchaser, may, however, decide to purchase such excess material at originally quoted prices and within an agreed time limit.

ANNEX B

(*Clauses* 5.1 *and* A-1.1)

LIST OF INDIAN STANDARDS FOR REFRACTORIES

B-1 ACID REFRACTORIES

B-1.1 Fireclay Refractories

IS No.	*Title*
IS 6 : 1983	Moderate heat duty fireclay refractories, group A (*fourth revision*)
IS 7 : 1980	Moderate heat duty fireclay refractories, group B (*fourth revision*)
IS 8 : 1983	High heat duty fireclay refractories (*fourth revision*)
IS 195 : 1963	Fireclay mortar for laying fireclay refractory bricks (*second revision*)
IS 1523 : 1972	Bottom pouring refractories for steel plants (*first revision*)
IS 1524 : 1968	Refractory sleeves (*first revision*)
IS 1525 : 1968	Ladle refractories for steel plant (*first revision*)
IS 1526 : 1960	Sizes and shapes for firebricks (230 mm series)
IS 1529 : 1971	Blast furnace refractories for steel plants (*first revision*)
IS 1751 : 1984	Fireclay cupola refractories (*first revision*)
IS 2042 : 1972	Insulating bricks (*first revision*)
IS 2043 : 1984	Siliceous fireclay refractories (*first revision*)
IS 4564 : 1968	Fireclay nozzles
IS 4565 : 1968	Fireclay stoppers
IS 5495 : 1969	Sizes and shapes for firebricks (300 mm and higher series)
IS 6727 : 1972	Fireclay checker-bricks for open-hearth furnaces
IS 6728 : 1972	Recuperator tubes, tiles and collars for soaking pits in steel plants
IS 7199 : 1974	Blast furnace stove refractories
IS 9010 : 1978	Super heat duty fireclay refractories

B-1.2 Silica Refractories

IS No.	*Title*
IS 484 : 1980	Silica refractories for general purposes (*second revision*)
IS 1292 : 1958	Mortar for laying silica bricks
IS 4812 : 1972	Silica refractories for coke oven (*first revision*)

B-1.3 High Alumina Refractories

IS No.	*Title*
IS 2044 : 1981	Silimanite refractories for glass melting tank furnaces (*first revision*)
IS 8953 : 1978	62 percent alumina bricks and blocks for blast furnaces

B-2 BASIC REFRACTORIES

IS No.	*Title*
IS 1749 : 1984	Magnesite refractories (*second revision*)
IS 1750 : 1983	Dead-burned pea magnesite (*second revision*)
IS 3304 : 1965	Burnt magnesite-chrome refractories for general purposes
IS 3305 : 1965	Burnt chrome-magnesite refractories for general purposes
IS 4801 : 1980	Chemically-bonded magnesite-chrome refractories for roof lining (*first revision*)
IS 4813 : 1980	Chemically-bonded magnesite-chrome rafractories for general purposes (*first revision*)
IS 4814 : 1980	Chemically-bonded magnesite-chrome refractories for general purposes (*first revision*)
IS 8966 : 1978	Magnesite nozzles

B-3 NEUTRAL REFRACTORIES

IS No.	*Title*
IS 1748 : 1981	Size of graphite crucibles (*first revision*)
IS 8977 : 1978	Clay bonded graphite crucibles
IS 9929 : 1981	Method for determining life of graphite crucibles
IS 9930 : 1981	Zircon refractories for glass furnace application
IS 10551 : 1983	Zircon mullite refractories for glass furnace applications
IS 11036 : 1984	Graphite stopper heads

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